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Naidus

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(54) **LEG PRESS MACHINE WITH A WEIGHT PLATE TRANSFER SYSTEM FOR REDUCING EXERCISE RESISTANCE WHILE REMAINING SEATED**

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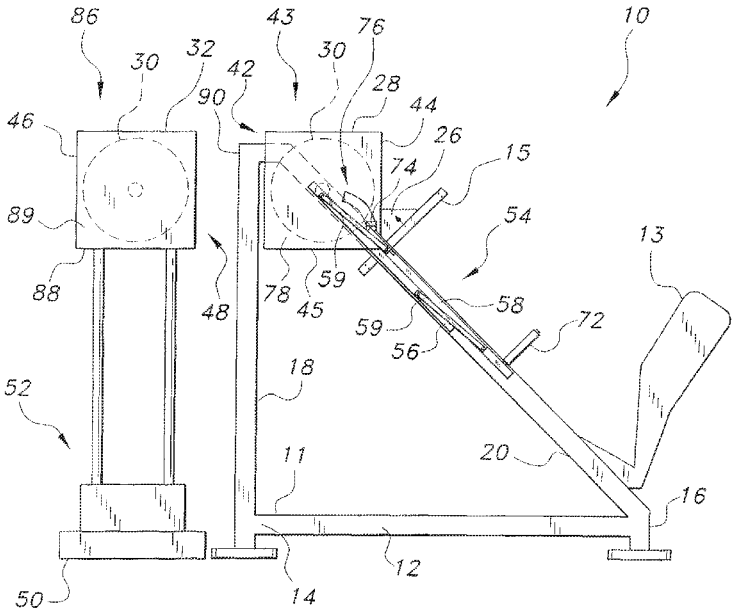
(57) **ABSTRACT**

A leg press machine with a weight plate transfer mechanism to reduce exercise resistance while remaining seated on the machine. Weight plates are movably supported within a sliding housing, rather than being received on a pair of side pegs, as in conventional leg press machines. One of the weight plates can be pushed to roll from the sliding housing to a storage housing by the exerciser using a weight transfer actuator, allowing the exerciser to reduce the exercise resistance conveniently while remaining seated. The storage housing is positioned with an open side facing an open side of the sliding housing so as to receive the weight plate pushed and rolled from the sliding housing. Additionally, by positioning the storage housing at substantially the same height as the sliding housing, the exerciser can easily roll one or more weight plates between the two housings so as to reduce the exercise resistance.

19 Claims, 7 Drawing Sheets



(51) **Int. Cl.**

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A63B 71/00	(2006.01)
A63B 71/06	(2006.01)

(52) **U.S. Cl.**

CPC ***A63B 21/4034*** (2015.10); ***A63B 21/4045*** (2015.10); ***A63B 23/0417*** (2013.01); *A63B 21/00065* (2013.01); *A63B 21/4033* (2015.10); *A63B 23/04* (2013.01); *A63B 2071/0072* (2013.01); *A63B 2071/0683* (2013.01); *A63B 2208/0233* (2013.01); *A63B 2208/0238* (2013.01)

(58) **Field of Classification Search**

CPC A63B 23/0417; A63B 21/4045; A63B 21/062; A63B 2208/0238; A63B 2071/0072; A63B 2071/0683; A63B 21/4033; A63B 2208/0233; A63B 23/04; B42P 2241/24; B65B 5/00; B65B 5/04; B65B 5/06; B65B 5/08

See application file for complete search history.

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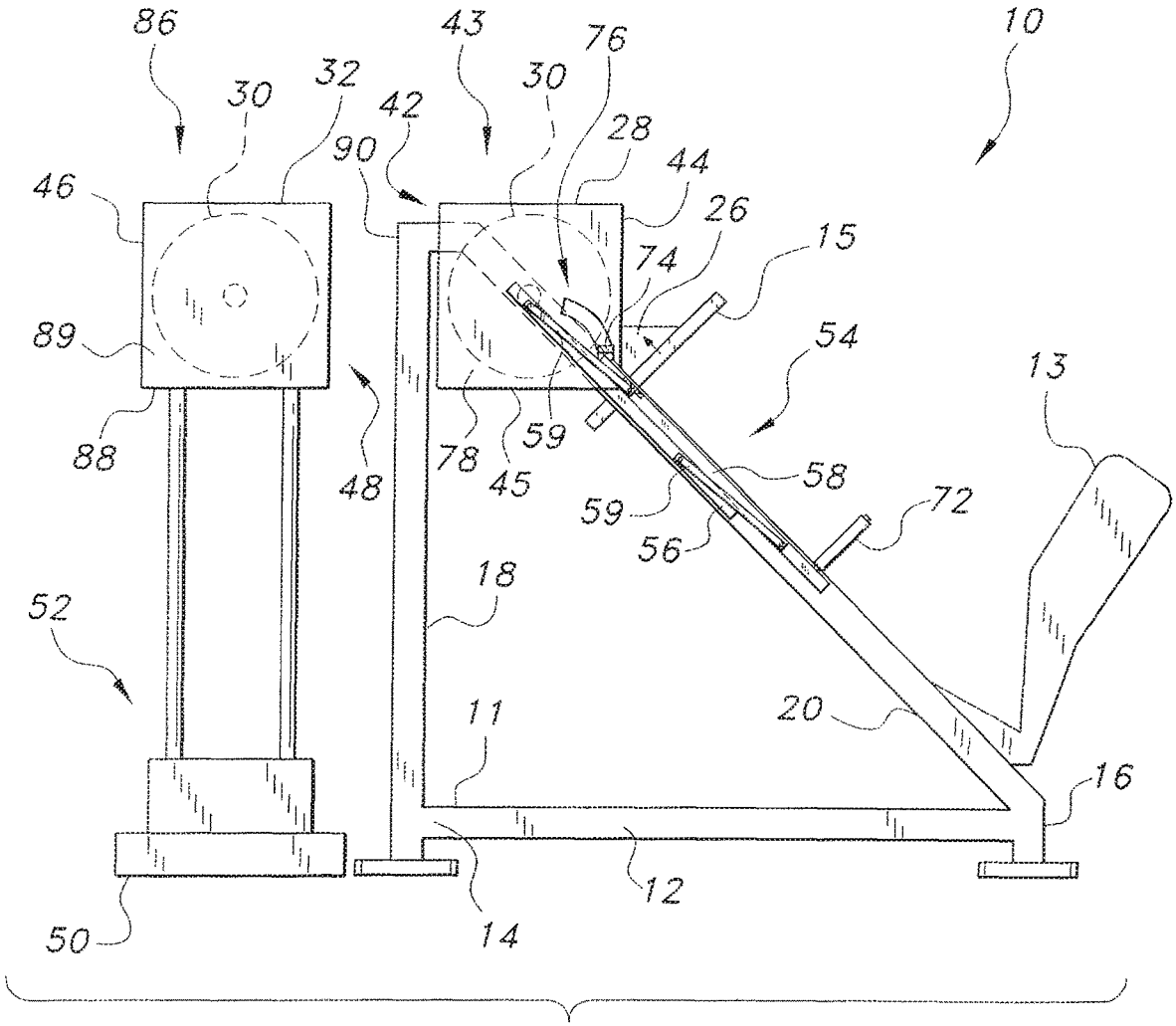
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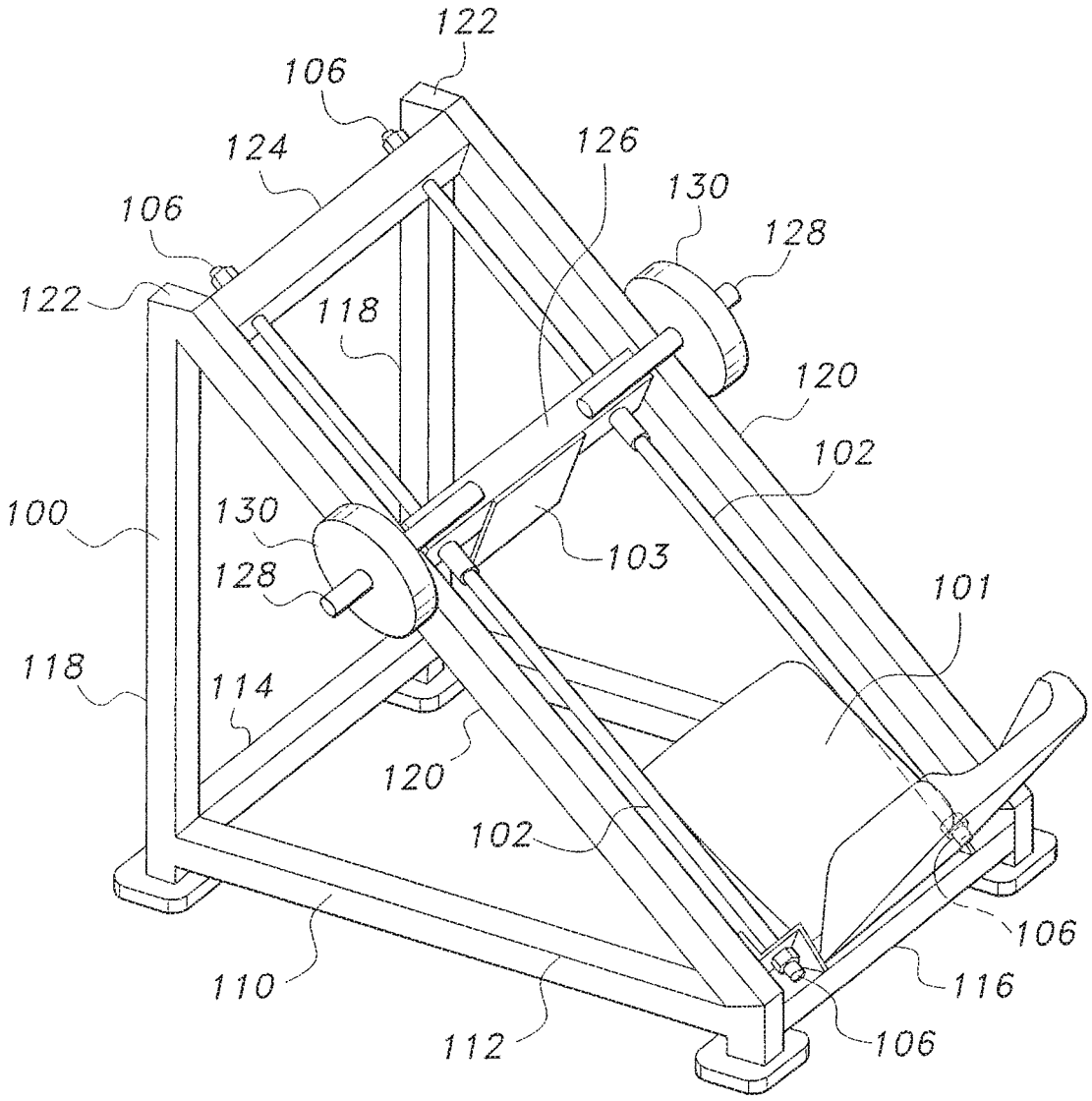
FIG. 1



PRIOR ART

FIG. 2

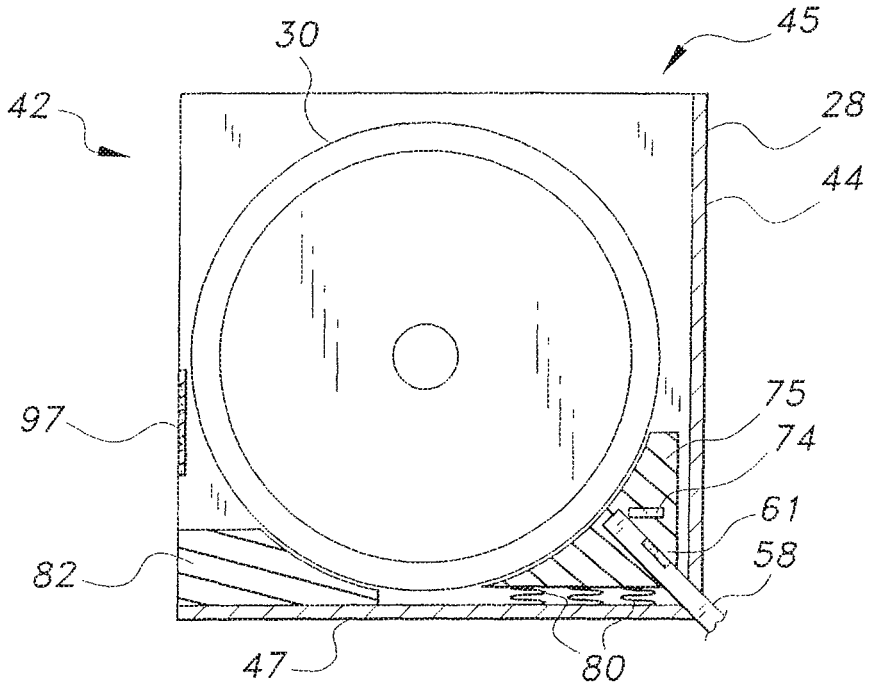

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FIG. 3A

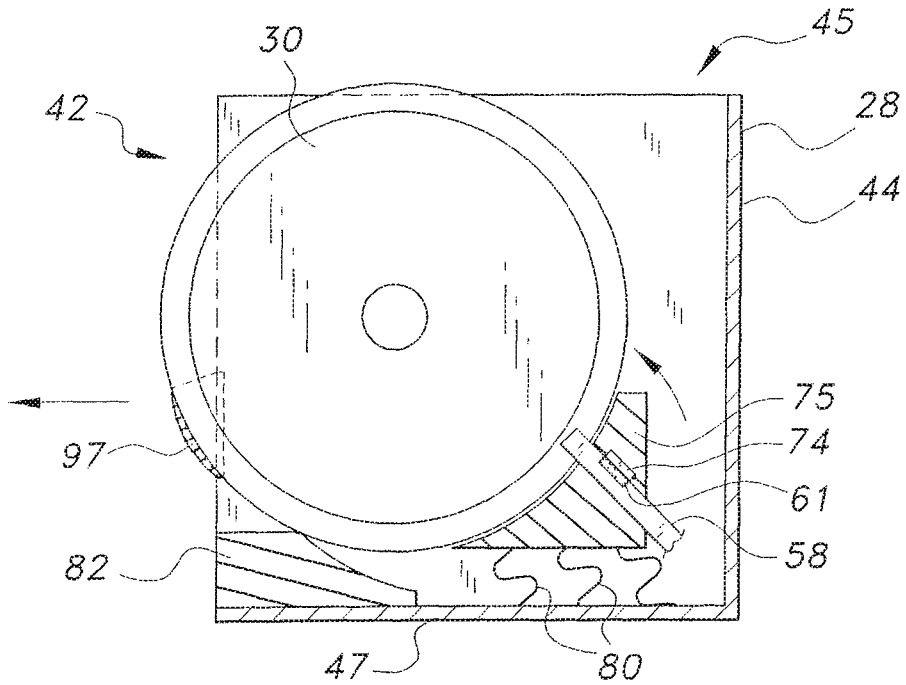
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FIG. 3B

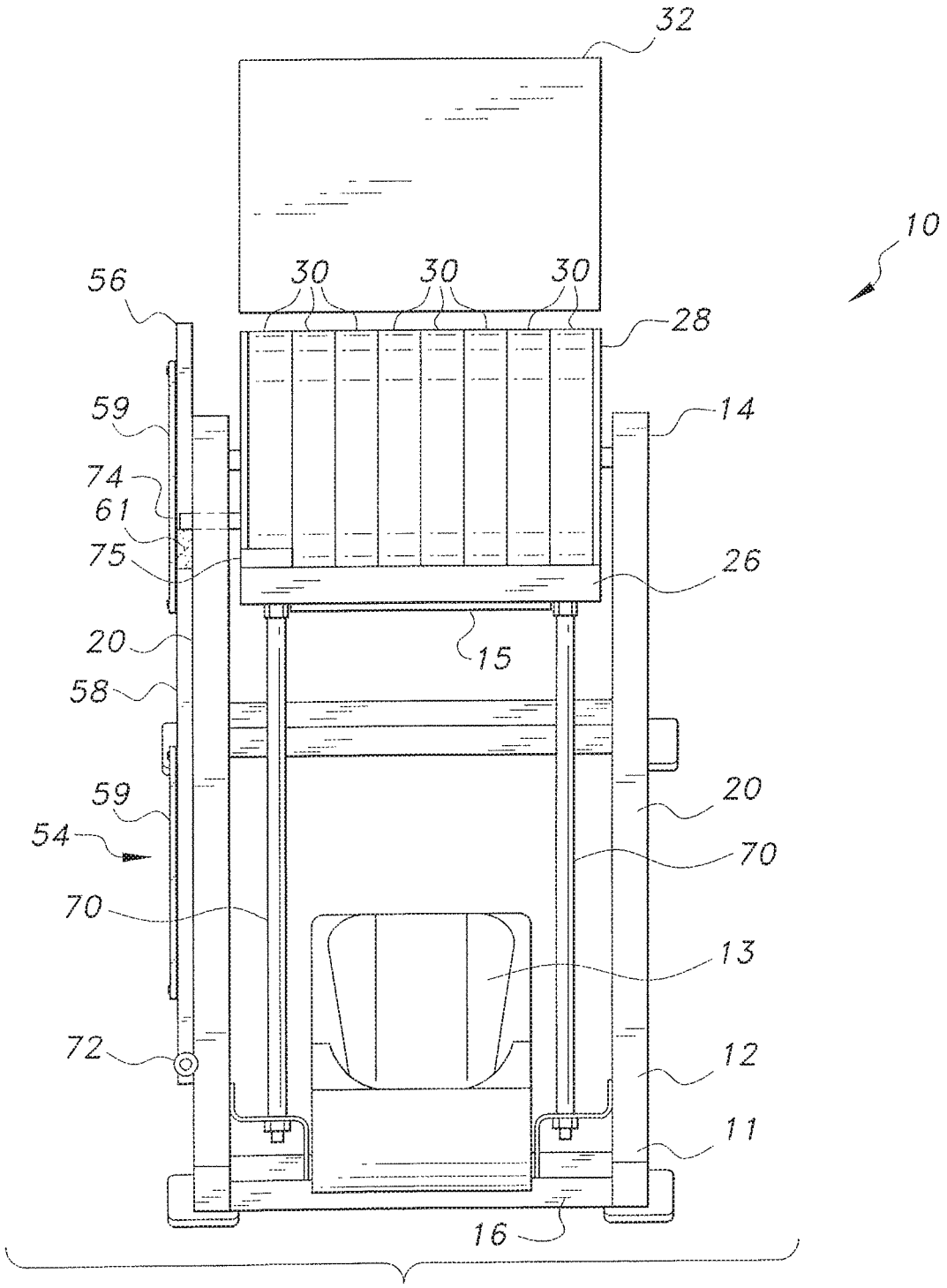
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FIG. 4

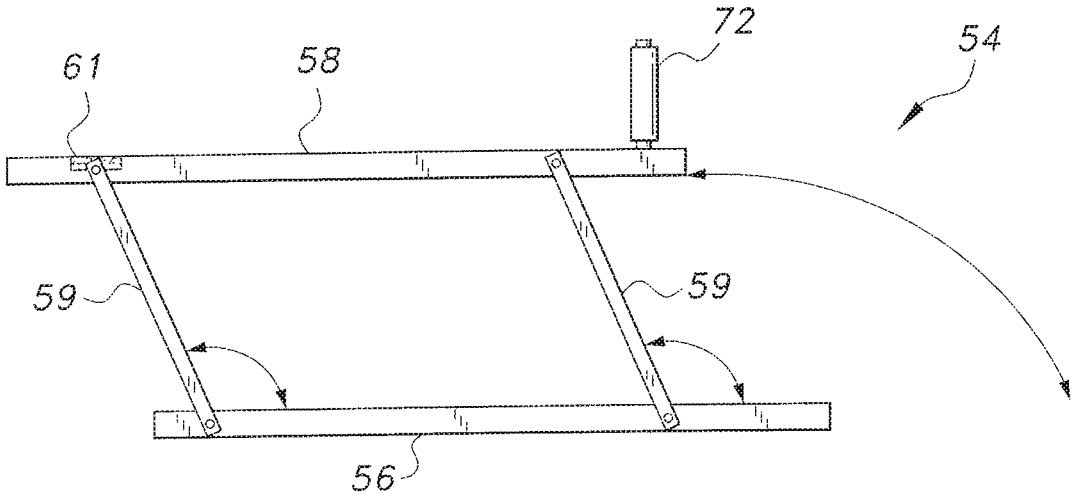

FIG. 5A

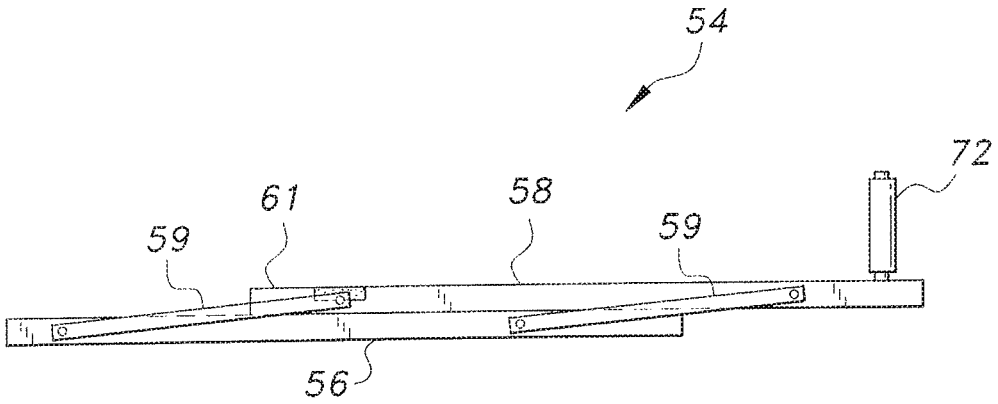

FIG. 5B

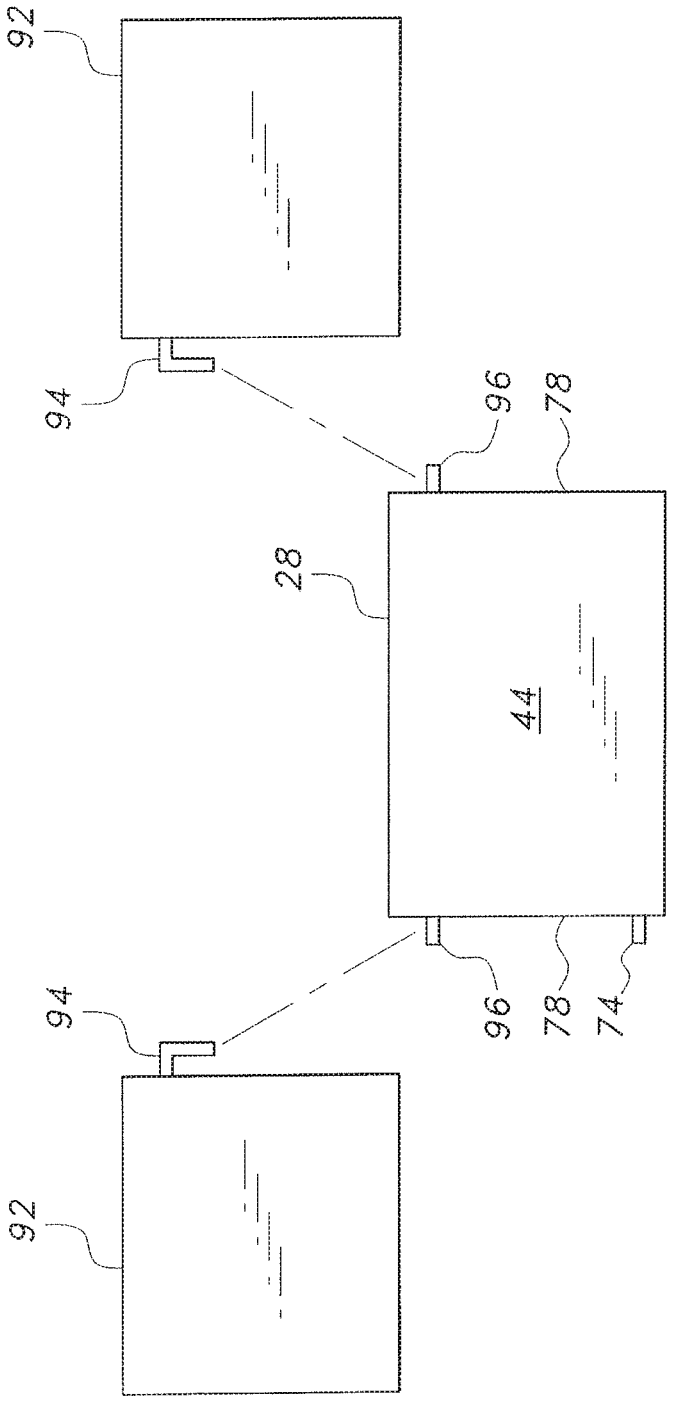

FIG. 6

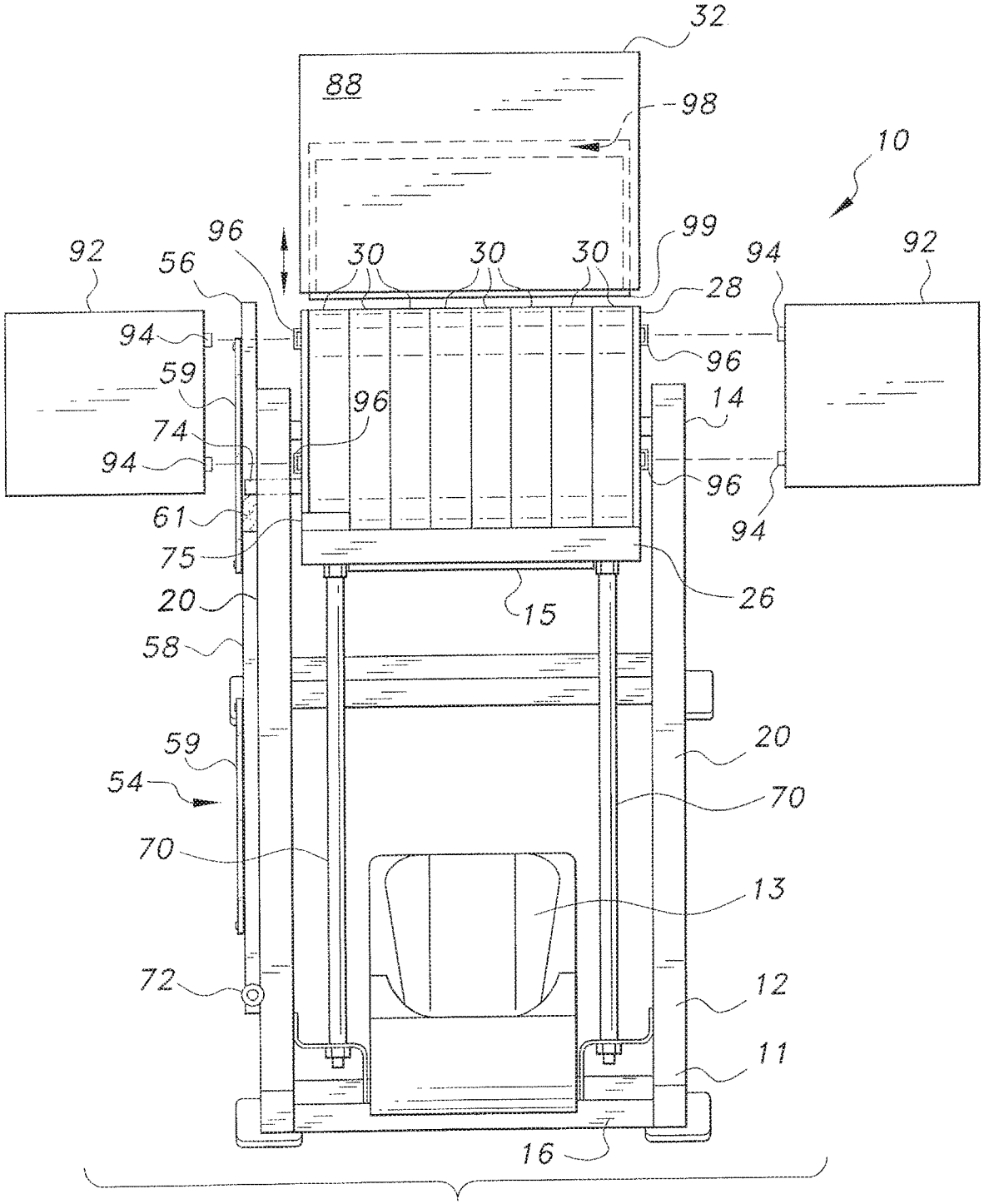
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FIG. 7

LEG PRESS MACHINE WITH A WEIGHT PLATE TRANSFER SYSTEM FOR REDUCING EXERCISE RESISTANCE WHILE REMAINING SEATED

FIELD OF THE INVENTION

The present invention relates generally to exercise equipment, and particularly to leg press machines.

BACKGROUND OF THE INVENTION

A leg press machine is exercise equipment for performing leg exercises, specifically the "leg press". A leg press is a weight training exercise in which an exerciser pushes a weight or resistance away from himself or herself using his or her legs.

FIG. **2** illustrates a conventional leg press machine of the diagonal "sled" type. The leg press machine **100** includes a seat **101** mounted to a frame **110**. Although the frames of leg press machines are known to have a wide variety of configurations, the frame **110** represents a typical frame having elements that are common in leg press machines, including a rectangular base **112** having front and rear ends **114**, **116**, respectively, a pair of vertical support members **118** attached to the front end **114** and projecting upward therefrom, and a pair of angled or inclined support members **120** extending between the upper ends **122** of the vertical support members **118** and opposite ends of the rear end **116** of the base **112**.

A horizontal cross bar **124** is secured to, and extends between, the upper ends **122** of vertical support members **118**. A pair of rails **102** positioned parallel and adjacent to the pair of angled or inclined support members **120** are secured to and extend between the horizontal cross bar **124** and the rear end **116** of the base **112**. The rails **102** may be secured by bolts **106** or the like, as shown. A sliding cross bar **126** is slidably mounted on the rails **102**. A foot rest **103** is secured to the sliding cross bar **126** such that the exerciser may sit in the seat **101** and push upward on the foot rest **103** during exercise. The sliding cross bar **126** is adjustably weighted to provide exercise resistance by removable weight plates **130**, which are removably mounted on pegs **128**, which are fixed to and extend outward from opposed ends of the sliding cross bar **126**.

In use, if the exerciser wishes to add or remove weight to change the exercise resistance, the exerciser must stop exercising, get off the leg press machine **100**, approach each side of the leg press machine **100**, and slide each weight plate **130** onto or off of respective pegs **128**. Moving unwanted weight plates **130** to storage to reduce exercise resistance, or adding desired additional weight plates **130** from storage, requires that the user interrupt use of the leg press machine **100**, and then use his or her arms, and particularly his or her back, to move the weight plates **130**. Thus, to adjust the exercise resistance of the leg press machine **100**, the exerciser must interrupt the exercise, which can reduce the effectiveness of the exercise, and the exerciser risks putting strain on his or her arms and/or back while moving the weights **130** onto, or off of, respective pegs **128** of the leg press machine **100**.

SUMMARY OF THE INVENTION

The leg press machine with a weight transfer system of the invention is similar in operation to a conventional 45° leg press machine, but with the weight plates carried within a sliding housing (also called an "exercise sled") that provides

exercise resistance, rather than being mounted on a pair of side pegs. The present leg press machine includes a frame similar to that of a conventional 45° leg press machine, including a base, a pair of vertical support members secured to the front end of the base and projecting upward therefrom, and a pair of inclined support members extending between respective upper ends of the pair of vertical support members and the rear end of the base. A seat is mounted to the rear end of the base of the frame in a conventional manner. The seat position can be adjusted to accommodate exercisers of different heights. Additionally, a pair of rails are respectively mounted parallel and adjacent to the pair of inclined support members such that a sliding cross bar may be slidably mounted thereon.

The sliding housing is mounted on the sliding cross bar for removably receiving a plurality of weight plates. The sliding housing has an open front end, an open upper end, a closed rear end, a closed lower end, and a pair of sidewalls. A movable mount is disposed within the sliding housing adjacent one of the sidewalls, such that a single one of the weight plates (i.e., the weight plate closest to the sidewall) may be removably mounted thereon. A push rod is pivotally secured to the movable mount and at least partially projects through a slot formed through the sidewall.

A weight transfer actuator is used by the exerciser desiring to reduce the exercise resistance of the leg press machine to selectively push the push rod so as to eject the weight plate from the sliding housing. The weight transfer actuator has a fixed bar, a moving bar, and a pair of pivoting links, such that the fixed bar, the moving bar, and the pair of pivoting links define a parallelogram linkage. The moving bar has a top surface adapted for releasable engagement with the push rod. The fixed bar is mounted on one of the inclined support members of the frame, allowing the exerciser to use the weight transfer actuator when in the seated exercise position, eliminating the need to get off the machine to reduce the exercise resistance. Thus, using the weight transfer actuator, the exercise resistance can be reduced quickly soon after the exerciser has reached a state of exhaustion, and then the exerciser can continue the exercise, which would not have been possible at the original level of exercise resistance.

A storage housing is positioned directly in front of the frame to receive the weight plate ejected from the sliding housing. Additionally, by positioning the storage housing at the same height as the sliding housing, the exerciser can easily roll one or more weight plates from the sliding housing to the storage housing so as to reduce the exercise resistance. The storage housing has a closed front end, an open rear end, an open upper end, a closed lower end, and a pair of sidewalls. The storage housing has an adjustable height, allowing the open rear end of the storage housing to be aligned with the open front end of the sliding housing, thereby allowing a weight plate to roll from the front-facing sliding housing to the storage housing.

One general aspect of the invention is a leg press machine with a weight transfer system for reducing exercise resistance while remaining seated. The leg press machine includes: a frame having a base including a front end and a rear end, a pair of vertical support members secured to the front end of the base and projecting upward therefrom, the vertical support members each having an upper end, and a pair of inclined support members extending between the respective upper ends of the vertical support members and the rear end of the base; a seat adjustably mounted to the rear end of the base of the frame; a pair of rails mounted parallel and adjacent to the pair of inclined support members,

respectively; a sliding cross bar slidably mounted on the pair of rails; a sliding housing secured to the sliding cross bar, the sliding housing having an open front end and a closed rear end, the sliding housing being configured to movably support a plurality of weight plates; and a storage housing having a closed front end and an open rear end, the storage housing being positioned such that the open rear end opens towards the open front end of the sliding housing, the storage housing being configured to receive and support at least one weight plate received from the sliding housing.

In some embodiments, the leg press machine further includes a sliding support plate configured to provide a bridge between the sliding housing and the storage housing to enable a weight plate to roll from the sliding housing to the storage housing.

In some embodiments, the leg press machine further includes a weight transfer actuator configured to cause a weight plate to roll from the sliding housing to the storage housing.

In some embodiments, the storage housing is configured to be adjustable in height so as to match the height of the sliding housing when the sliding housing is pushed upward along the pair of rails so as to reach a maximum extent of travel along the pair of rails.

In some embodiments, the sliding housing has a pair of opposing sidewalls extending between the front end and the rear end, at least one of the sidewalls having a slot defined therein, and the leg machine further includes: a movable mount disposed within the sliding housing, the movable mount having a side portion and a rear portion, the movable mount being configured urge a weight plate upward and forward; a push rod rotatably attached to the side of the movable mount adjacent the rear portion, the push rod at least partially projecting through the slot in the at least one sidewall of the sliding housing; and a weight transfer actuator having a fixed bar, a moving bar, and a pair of pivoting links defining a parallelogram linkage, the moving bar having a top surface selectively and releasably engaging the push rod to lift the rear portion of the movable mount so as to tip the weight plate forward and roll the weight plate from the sliding housing to the storage housing.

Another general aspect of the invention is a leg press machine with a weight transfer system for decreasing exercise resistance while remaining seated. This leg press machine includes: a frame having a pair of inclined support members; a seat adjustably mounted to the frame; a pair of rails mounted parallel and adjacent to the pair of inclined support members, respectively; a sliding cross bar slidably mounted on the pair of rails; a sliding housing mounted on the sliding cross bar, the sliding housing having an open front end, a closed rear end, and a pair of opposing sidewalls extending between the front end and the rear end, at least one of the sidewalls having a slot defined therein, the sliding housing being configured to movably carry a plurality of weight plates; a movable mount disposed within the sliding housing, the movable mount having a side and a rear portion, the movable mount being configured to urge one of the weight plates forward and upward; a push rod rotatably attached to the side of the movable mount adjacent the rear portion, and at least partially projecting through the slot in the at least one sidewall of the sliding housing; a storage housing having a closed front end and an open rear end, the storage housing being positioned such that the open rear end opens towards the open front end of the sliding housing, the storage housing being configured to receive and support at least one weight plate received from the sliding housing; and a weight transfer actuator having a fixed bar, a moving bar, and a pair of pivoting links defining a parallelogram linkage, the moving bar having a top surface configured to releasably engage the push rod so as to lift the rear portion of the movable mount so as to urge the weight plate forward, and thereby roll the weight plate from the sliding housing to the storage housing.

In some embodiments, the leg press machine further includes a sliding support plate configured to provide a bridge between the sliding housing and the storage housing so as to enable a weight plate to roll from the sliding housing to the storage housing.

In some embodiments, the storage housing is configured to be adjustable in height so as to substantially match the height of the sliding housing when the sliding housing is pushed upward along the pair of rails so as to reach a maximum extent of travel along the pair of rails.

In some embodiments, the frame further includes: a base including a front end and a rear end; and a pair of vertical support members secured to the front end of the base and projecting upward therefrom, each of the vertical support members having an upper end, the pair of inclined support members of the frame extending between the respective upper ends of the vertical support members and the rear end of the base.

Yet another general aspect of the invention is a leg press machine with a weight transfer system for reducing exercise resistance while remaining seated. This leg press machine includes: a frame having a pair of inclined support members; a pair of rails, each rail mounted to an inclined support member of the pair of inclined support members; a sliding cross bar slidably mounted on the pair of rails; a sliding housing mounted on the sliding cross bar, the sliding housing configured to receive and movably support at least one weight plate along the pair of rails up to a maximum extent of travel along the pair of rails; a storage housing positioned to receive a weight plate pushed from the sliding housing; and a weight transfer actuator configured to push a weight plate from the sliding housing, and cause the weight plate to roll from the sliding housing to the storage housing, thereby reducing the exercise resistance.

In some embodiments, the storage housing is configured to be positioned at a height determined by a maximum extent of travel of the sliding housing.

In some embodiments, the pair of inclined support members of the frame are slanted at 45°.

In some embodiments, the leg press machine further includes a seat adjustably mounted to the frame so as to accommodate a height of an exerciser.

In some embodiments, the sliding housing includes a movable mount configured to support a weight plate, the movable mount also being configured to be lifted so as to urge the weight plate to begin rolling towards the storage housing.

In some embodiments, the weight transfer actuator includes a push rod pivotally secured to the movable mount, the push rod being configured to push a weight plate from the sliding housing.

In some embodiments, the weight transfer actuator includes: a fixed bar; a moving bar; and a pair of pivoting links, such that the fixed bar, the moving bar, and the pair of pivoting links define a parallelogram linkage.

In some embodiments, the moving bar has a top surface configured to releasably engage the push rod.

In some embodiments, the fixed bar is mounted along one of the inclined support members of the frame.

In some embodiments, the storage housing is positioned at substantially the height reached by the sliding housing

when the sliding housing is pushed upward along the pair of rails so as to reach a maximum extent of travel along the pair of rails.

In some embodiments, the seat adjustably mounted to the frame is configured to be adjusted so that the sliding housing can be pushed upward by an exerciser along the pair of rails so as to reach a maximum extent of travel along the pair of rails when the exerciser extends his or her legs to a maximum extent.

BRIEF DESCRIPTION OF THE DRAWINGS

Many additional features and advantages will become apparent to those skilled in the art upon reading the following description, when considered in conjunction with the accompanying drawings, wherein:

FIG. **1** is a side view of a leg press machine with a weight transfer system.

FIG. **2** is a perspective view of a prior art leg press machine.

FIG. **3**A is a side view in section of a sliding housing of the leg press machine of FIG. **1**, shown with a weight plate at rest.

FIG. **3**B is a side view in section of a sliding housing of the leg press machine of FIG. **1**, shown in a configuration for ejecting a weight plate so as to reduce exercise resistance of the leg press machine.

FIG. **4** is a top view of the leg press machine of FIG. **1**.

FIG. **5**A is a side view of a weight transfer actuator of the leg press machine of FIG. **1**, shown in an extended configuration.

FIG. **5**B is a side view of the weight transfer actuator of the leg press machine of FIG. **1**, shown in a non-extended configuration.

FIG. **6** is a rear view of a sliding housing along with additional add-on weight shelves of an alternative embodiment of a leg press machine with a weight transfer mechanism.

FIG. **7** is a top view of the alternative leg press machine of FIG. **6**.

DETAILED DESCRIPTION

An embodiment of the leg press machine with a weight transfer system **10** is similar in operation to a conventional 45° leg press machine, such as leg press machine **100** of FIG. **2**, but with weight plates **30** carried within a sliding housing **28**, rather than being received on a pair of side pegs.

As shown in FIGS. **1** and **4**, the leg press machine with a weight transfer system **10** includes a frame **11** having a base **12**, a pair of vertical support members **18** secured to the front end **14** of base **12** and projecting upward therefrom, and a pair of inclined support members **20** extending between respective upper ends **90** of the pair of vertical support members **18** and the rear end **16** of the base **12**. A seat **13** is mounted to the rear end **16** of the base **12** of the frame **11** in a conventional manner. The seat **13** can be secured at various points along the pair of included support members **20** so as to accommodate exercisers of various heights.

Additionally, a pair of rails **70** are respectively mounted parallel and adjacent to the pair of inclined support members **20** such that a sliding cross bar **26** may be slidably mounted upon the pair of rails **70**, similar to that of the conventional 45° leg press machine **100** of FIG. **2**. A foot rest **15** is secured to the cross bar **26**, allowing the exerciser to push the sliding cross bar **26** with his or her legs.

A sliding housing **28** is secured to the sliding cross bar **26** for removably receiving a plurality of weight plates **30**. The weight plates **30** are preferably conventional circular weight plates, such as those used with a conventional 45° leg press machine. The sliding housing **28** has an open front end **42**, an open upper end **43**, a closed rear end **44**, a closed lower end **45**, and a pair of sidewalls **78**.

As best seen in FIGS. **3**A, **3**B, and **4**, a movable mount **75** is disposed within the sliding housing **28** adjacent one of the sidewalls **78**, such that a single one of the weight plates (e.g., the weight plate closest to the sidewall) can be removably mounted thereon. A push rod **74** is pivotally attached to the movable mount **75** so that it is rotatable about a pin or swivel, and at least partially projects through a slot **76** formed through the sidewall **78**.

In FIGS. **1** and **4**, the movable mount **75**, slot **76**, and push rod **74** are shown positioned to the left side of the exerciser when the exerciser is in the seated exercise position. It should be understood that the selection of the left side is for exemplary purposes only, and that the movable mount **75**, slot **76**, and push rod **74** can alternatively be positioned on the right side of the exerciser when the exerciser is seated in seat **13**. Alternatively, a movable mount **75**, slot **76**, and push rod **74** can be on both the right and left sides so that two weight plates can be removed from the sliding housing **28**.

In this embodiment, the left-most one of weight plates **30** is in contact with movable mount **75** within the sliding housing **28**, and the remainder of the weight plates **30** are only in contact with the closed lower wall **45** and one another, and the right-most weight plate is in contact with the other sidewall **78**.

The weight plates **30** are removably held in place by a contoured lip or rim **82** to prevent them from accidentally falling out of the open front end **42**. A weight transfer actuator **54** is used by the exerciser to selectively push the push rod **74** to eject the left-most weight plate **30** from the sliding housing **28** when the exerciser wants to reduce the exercise resistance in the amount of one weight plate.

As best seen in FIGS. **5**A and **5** B, the weight transfer actuator **54** has a fixed bar **56**, a moving bar **58**, and a pair of pivoting links **59**, such that the fixed bar **56**, the moving bar **58**, and the pair of pivoting links **59** define a parallelogram linkage, allowing the moving bar **58** to travel along an arcuate path of constant radius. A top surface of the moving bar **58** is preferably coated with rubber or the like, preferably adjacent the front end **61**, allowing for secure releasable engagement with the push rod **74**, which is also preferably coated with rubber or any other material having a high coefficient of friction to reduce slippage and ensure movement of the push rod **74** in the slot **76** when pushed by the moving bar **58**. The fixed bar **56** is mounted on one of the inclined support members **20** of the frame **11**, allowing the exerciser to use the weight transfer actuator **54** when in the seated exercise position. The weight transfer actuator **54** is mounted on the inclined support member **20** on the same selected side as the movable mount **75**, slot **76**, and push rod **74** (i.e., to the left of the seated exerciser in the example of FIGS. **1** and **4**).

A gripping handle **72** is secured to the moving bar **58**, allowing the user to easily rotate the moving bar **58** from the collapsed position of FIG. **5**B into the extended position of FIG. **5**A. As shown in FIG. **3**B, the rubber-coated top surface of the moving bar **58** of weight transfer actuator **54** selectively contacts the push rod **74**.

Since a parallelogram linkage causes the moving bar **58** to travel along a semicircular path, the weight transfer actuator **54** initially begins in a fully collapsed non-extended posi-

tion, such as that shown in FIGS. **1** and **5**B. The rubber-coated top surface adjacent the front end **61** of the moving bar **58** is positioned under and contiguous to the push rod **74**, and movement of the moving bar **58** lifts the push rod **74** to travel along a path of constant radius within the slot **76**, which, as shown, defines a partial-circular arc. It should be understood that the push rod **74** is flat and is preferably pivotal or swiveling with respect to the movable mount **75**, allowing for the rubber-coated top surface of the moving bar **58** to maintain contact with a larger surface area of the push rod **74** than merely the edge of the flat push rod **74** throughout its arcuate motion.

With the user urging the moving bar **58** forward and upward by pushing the handle **72**, the push bar **74** is pushed upward along its constant radius, arcuate path (within the arcuate slot **76**), thus lifting the rear portion of the movable mount and urging the movable mount **75** to tip forward, as shown in FIG. **3**B. As shown, the movable mount **75** is preferably resiliently biased by springs **80** or the like. With sufficient force, the exerciser is able to tip the movable mount **75** with respect to the lower end **47** of the sliding housing **28** such that the left-most weight plate **30** (in this exemplary configuration) is pushed over the lip or rim **82** for ejection out of the sliding housing **28** through the open front end **42**. Additionally, as shown in FIGS. **3**A and **3**B, the open front end **42** of the sliding housing **28** may have a rubber band **97**, elastic band or the like stretched horizontally across (fixed to and extending between the sidewalls **78**) the open front end **42**. Although a weight plate **30** can easily roll over the rubber band **97**, elastic band, or the like, as shown in FIG. **3**B, the rubber band **97** gives sufficient resistance against accidental rolling that may be caused by vibration, motion of the sliding housing **28**, small jolts, etc. It should be understood that a similar rubber band, elastic band, or the like may also stretch across the open rear end **48** of storage housing **32**, as will be described in detail below.

A storage housing **32** is positioned directly in front of the frame **11** to receive the weight plate **30** ejected from the sliding housing **28**. Alternatively, a sliding support plate **99** can provide a bridge between the sliding housing **28** and the storage housing **32**, as shown and explained in FIG. **7** that allows the storage housing to be located at a convenient distance from the sliding housing **28** when the sliding housing **28** reaches the maximum extent of travel upward along the pair of inclined rails **70**. The maximum extent of travel can be enforced by stop bumpers attached to the rails **70**. The seat **13** can be adjusted along the rails **70** so that the maximum extent of travel substantially matches the maximum extension distance of the exerciser's legs.

Additionally, by positioning the storage housing **32** using the conventional pneumatic lift **52** (shown in FIG. **1**) at the same height as the height of the sliding housing **28** when it reaches and is maintained by the exerciser at the maximum extent of travel upward along the pair of rails **70**, the exerciser can easily roll one or more weight plates **30** between the two housings **28**, **32**. Thus, the leg press machine **10** of the invention enables the exerciser to reduce the exercise resistance immediately after exercise exhaustion has been reached, while remaining seated and with the exerciser's knees straight and legs fully extended so as to support the sliding housing **28** at a point of maximum travel upward along the pair of rails **70**, while the user uses the weight transfer actuator **54** to roll a weight plate from the sliding housing **28** to the storage housing **32**.

The storage housing **32** has a closed front end **46**, an open rear end **48**, an open upper end **86**, a closed lower end **88**, and a pair of sidewalls **89**. The storage housing **32** has an adjustable height, allowing the open rear end **48** of the storage housing **32** to be aligned with the open front end **42** of the sliding housing **28**. In FIG. **1**, the storage housing **32** is shown mounted on a conventional pneumatic lift **52**, which is positioned on a base **50** directly in front of the front end **14** of the base **12** of the frame **11**. It should be understood that the pneumatic lift **52** is shown for exemplary purposes only, and that the storage housing **32** may be vertically adjusted by any suitable type of vertically adjustable mount, such as a hydraulic lift, a chain and pulley system, mechanical lift, a linear actuator, or the like.

Additionally, as shown in the alternative embodiment of FIGS. **6** and **7**, one or more add-on shelves **92** may be mounted on the sidewalls **78** of the sliding housing **28** (above the slot **76**), allowing the exerciser to add more weight beyond the capacity of the interior of the sliding housing **28**. As shown, brackets **96** may be secured to each sidewall **78**, allowing the add-on shelves **92** to be removably mounted to the sliding housing **28** through engagement with hooks **94**. It is important to note that the height of each add-on shelf **92** should be smaller than the height of the sidewalls **78**, thus leaving clearance for the slot **76**. Alternatively, brackets **96** and hooks **94** should be arranged at sufficient height to allow the add-on shelves **92** to clear the slot **76**.

As shown in FIGS. **6** and **7**, there may be two add-on shelves **92**, one for each sidewall **78**. It should be understood that the size requirement for the add-on shelf **92** to allow clearance for the slot **76** is only necessary for the add-on shelf **92** positioned above the slot **76**. The other one of the add-on shelves **92** has no such size requirement, since the slot **76** is only formed through one of the sidewalls **78**.

Further, as shown in FIG. **7**, the closed lower end **88** of storage housing **32** may have a slot or cavity **98** for slidably receiving a sliding support plate **99**. Since the distance between the storage housing **32** and the sliding housing **28** will be variable, the sliding plate **99** may be releasably withdrawn from the slot or cavity **98** to extend between the storage housing **32** and the sliding housing **28**, allowing the weight plates **30** to be easily rolled between the sliding housing **28** and the storage housing **32**.

It is to be understood that the leg press machine with a weight transfer system is not limited to the specific embodiments described above, but encompasses any and all embodiments within the scope of the generic language of the following claims enabled by the embodiments described herein, or otherwise shown in the drawings, or described above in terms sufficient to enable one of ordinary skill in the art to make and use the claimed subject matter.

Other modifications and implementations will occur to those skilled in the art without departing from the spirit and the scope of the invention as claimed. Accordingly, the above description is not intended to limit the invention, except as indicated in the following claims.

What is claimed is:

1. A leg press machine with a weight transfer system for reducing exercise resistance while remaining seated, the leg press machine comprising:

a frame having:

a base including a front end and a rear end;

a pair of vertical support members secured to the front end of the base and projecting upward therefrom, the vertical support members each having an upper end; and

a pair of inclined support members extending between the respective upper ends of the vertical support members and the rear end of the base;

a seat adjustably mounted to the rear end of the base of the frame;

a pair of rails mounted parallel and adjacent to the pair of inclined support members, respectively;

a sliding cross bar slidably mounted on the pair of rails;

a sliding housing secured to the sliding cross bar, the sliding housing having an open front end and a closed rear end, the sliding housing being configured to movably support a plurality of weight plates;

a storage housing having a closed front end and an open rear end, the storage housing being positioned such that the open rear end opens towards the open front end of the sliding housing, the storage housing being configured to receive and support at least one weight plate received from the sliding housing; and

a weight transfer actuator configured to cause the weight plate to roll from the sliding housing to the storage housing.

2. The leg press machine of claim **1**, further including a sliding support plate configured to provide a bridge between the sliding housing and the storage housing to enable the weight plate to roll from the sliding housing to the storage housing.

3. The leg press machine of claim **1**, wherein the storage housing is configured to be adjustable in height so as to match the height of the sliding housing when the sliding housing is pushed upward along the pair of rails so as to reach a maximum extent of travel along the pair of rails.

4. The leg press machine of claim **1**, wherein the sliding housing has a pair of opposing sidewalls extending between the front end and the rear end, at least one of the sidewalls having a slot defined therein, the leg machine further comprising:

a movable mount disposed within the sliding housing, the movable mount having a side portion and a rear portion, the movable mount being configured urge the weight plate upward and forward; and

a push rod rotatably attached to the side of the movable mount adjacent the rear portion, the push rod at least partially projecting through the slot in the at least one sidewall of the sliding housing,

the weight transfer actuator having a fixed bar, a moving bar, and a pair of pivoting links defining a parallelogram linkage, the moving bar having a top surface selectively and releasably engaging the push rod to lift the rear portion of the movable mount so as to tip the weight plate forward and roll the weight plate from the sliding housing to the storage housing.

5. A leg press machine with a weight transfer system for decreasing exercise resistance while remaining seated, the leg press machine, comprising:

a frame having a pair of inclined support members;

a seat adjustably mounted to the frame;

a pair of rails mounted parallel and adjacent to the pair of inclined support members, respectively;

a sliding cross bar slidably mounted on the pair of rails;

a sliding housing mounted on the sliding cross bar, the sliding housing having an open front end, a closed rear end, and a pair of opposing sidewalls extending between the front end and the rear end, at least one of the sidewalls having a slot defined therein, the sliding housing being configured to movably carry a plurality of weight plates;

a movable mount disposed within the sliding housing, the movable mount having a side and a rear portion, the movable mount being configured to urge one of the weight plates forward and upward;

a push rod rotatably attached to the side of the movable mount adjacent the rear portion, and at least partially projecting through the slot in the at least one sidewall of the sliding housing;

a storage housing having a closed front end and an open rear end, the storage housing being positioned such that the open rear end opens towards the open front end of the sliding housing, the storage housing being configured to receive and support at least one weight plate received from the sliding housing; and

a weight transfer actuator having a fixed bar, a moving bar, and a pair of pivoting links defining a parallelogram linkage, the moving bar having a top surface configured to releasably engage the push rod so as to lift the rear portion of the movable mount so as to urge the weight plate forward, and thereby roll the weight plate from the sliding housing to the storage housing.

6. The leg press machine of claim **5**, further including a sliding support plate configured to provide a bridge between the sliding housing and the storage housing so as to enable the weight plate to roll from the sliding housing to the storage housing.

7. The leg press machine of claim **5**, wherein the storage housing is configured to be adjustable in height so as to substantially match the height of the sliding housing when the sliding housing is pushed upward along the pair of rails so as to reach a maximum extent of travel along the pair of rails.

8. The leg press machine of claim **5**, wherein the frame further includes:

a base including a front end and a rear end; and

a pair of vertical support members secured to the front end of the base and projecting upward therefrom, each of the vertical support members having an upper end,

the pair of inclined support members of the frame extending between the respective upper ends of the vertical support members and the rear end of the base.

9. A leg press machine with a weight transfer system for reducing exercise resistance while remaining seated, the leg press machine comprising:

a frame having a pair of inclined support members;

a pair of rails, each rail mounted to an inclined support member of the pair of inclined support members;

a sliding cross bar slidably mounted on the pair of rails;

a sliding housing mounted on the sliding cross bar, the sliding housing configured to receive and movably support at least one weight plate along the pair of rails up to a maximum extent of travel along the pair of rails;

a storage housing positioned to receive the weight plate pushed from the sliding housing; and

a weight transfer actuator configured to push the weight plate from the sliding housing, and cause the weight plate to roll from the sliding housing to the storage housing, thereby reducing the exercise resistance.

10. The leg press machine of claim **9**, further including:

a seat adjustably mounted to the frame so as to accommodate a height of an exerciser.

11. The leg press machine of claim **9**, wherein the sliding housing includes:

a movable mount configured to support the weight plate, the movable mount also being configured to be lifted so as to urge the weight plate to begin rolling towards the storage housing.

12. The leg press machine of claim 9, wherein the weight transfer actuator includes:

a fixed bar; a moving bar; and a pair of pivoting links,

such that the fixed bar, the moving bar, and the pair of pivoting links define a parallelogram linkage.

13. The leg press machine of claim 12, wherein the moving bar has a top surface configured to releasably engage the push rod.

14. The leg press machine of claim 12, wherein the fixed bar is mounted along one of the inclined support members of the frame.

15. The leg press machine of claim 9, wherein the storage housing is configured to be positioned at a height determined by a maximum extent of travel of the sliding housing.

16. The leg press machine of claim 9, wherein the pair of inclined support members of the frame are slanted at 45°.

17. The leg press machine of claim 9, wherein the weight transfer actuator includes:

a push rod pivotally secured to the movable mount, the push rod being configured to push the weight plate from the sliding housing.

18. The leg press machine of claim 9, wherein the storage housing is positioned at substantially the height reached by the sliding housing when the sliding housing is pushed upward along the pair of rails so as to reach a maximum extent of travel along the pair of rails.

19. The leg press machine of claim 10, wherein the seat adjustably mounted to the frame is configured to be adjusted so that the sliding housing can be pushed upward by an exerciser along the pair of rails so as to reach a maximum extent of travel along the pair of rails when the exerciser extends his or her legs to a maximum extent.

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